EA-6B UNIVERSAL EXCITER ManTech PROGRAM (A0774 & A0775)

PROBLEM / OBJECTIVE

A decision has been made to extend the service life of the Navy EA-6B (Prowler) aircraft to at least the year 2005. Further, this aircraft has been given responsibility for all battlefield tactical airborne electronic warfare, a responsibility previously shared with the Air Force. All EA-6B aircraft must be upgraded to the Block 89A configuration to support this DoD decision. Production of the computer interface unit (CIU/E), manufactured by the Litton Guidance and Control Systems (GCS) division, and of the upgraded Universal Exciter (UEU) manufactured by AIL Systems, must be restarted after a production gap from 1990 to the present to provide the avionics required for this aircraft update program. Both units represent electronic design practice of the mid-80s and use components and technology which are obsolete and, in some cases, no longer available.

APPROACH / BUSINESS STRATEGY

Manufacturing technology project plans were developed and awarded to AIL Systems and to Litton GCS for restart of production and introduction of manufacturability upgrades and advanced manufacturing technology to achieve significant reduction in the cost of the new production units. The plans included specific cost reduction goals, specifically a 10% UPC savings incorporated into pricing for acquisition, for the follow-on production units and company cost savings relative to the previously produced units.

In general, the AIL Systems approach has been to insert all-digital technology into the UEU which permits use of the most recent advances in manufacturing equipment and processes to produce state-of-the-art manufacturing facility and product.

ACCOMPLISHMENTS /PAYOFF

Universal Exciter Cost Savings

The AIL Systems project, awarded in 15 April, 1996, involves extensive digital technology insertion.

Nine specific ManTech initiatives were identified and projected to produce cost savings of over $1.6M on the first production lot of 116 units. In the AIL Systems production proposal to PMA234, these savings were explicitly incorporated into the proposed price for the first production lot. Since eventual production could exceed 500 units, the savings produced for this program alone exceed $5M. In addition, the introduction of the most current manufacturing equipment and processes into the AIL Systems production facility will produce similar cost reductions in other military and commercial products. AIL Systems facility capitalization to support these ManTech initiatives is in excess of $900,000. The AIL Systems' cost share/leverage amount, as audited, is $2,571K in support of a ManTech investment of $2,900K to produce

immediate savings of $1.6M on the target program with an upside potential over three times that amount.

These savings were produced by adopting ball grid array and multi-chip module digital electronics packaging technology, introduction of a cutting edge surface mount technology production facility (continuous feed reflow soldering, fine pitch pick and place, solder paste screen printing), I/O connector soldering robotic workcell and advanced materials and processes for microwave transmission medium production which will increase yield from 50% to over 85%.

The project is now is its eighth month of execution. As of the January program review, the project is on budget and has schedule margin of over 3 months relative to delivery of the first production unit. Indications to date are that schedule delays are indeed being recouped as projected and that cost performance index remains over 0.95.

Computer Interface Unit Upgrade Cost Savings

The Litton award was made in July, 1996 to develop a product baseline and production restart methodology using the CIU/E as the prototype application. This program differs from the UEU project in that the CIU/E design and production technology remain unchanged. Only those changes required to eliminate obsolete components by substitution of current alternatives and to correct printed wiring board cuts and jumpers are being made. To date, this project is on budget and ahead of schedule.

Both projects will meet the requirements of the EA-6B upgrade program and will produce UPC savings of over 10% relative to the previous procurement cost of the units. These savings are built into the fixed price production contracts negotiated with AIL Systems and with Litton Guidance and Control Systems.

TIMELINE / MILESTONES

UEU

AIL Systems ManTech Contract Award: 4/96
MCM/BGA design complete: 12/96
Manufacturing process demonstrations: 4/97
(Paste deposition, pick and place, reflow,
robotic I/O connector soldering)
Integrated process demonstration: 9/97

CIU/E

Litton GCS ManTech Contract Award: 7/96
CIU/E Baseline definition: 9/96
Design modifications PDR: 1/97
Process demonstrations/breadboard test: 7/97
Design and process complete: 10/97

FUNDING

ManTech: $6,825
Cost share/leverage: $6,708
Total Program Cost: $13,533

UEU Program

Program Cost: $2.9M

ROI Summary:

The initial production savings of $1.6M has been realized in the first buy (116 units). Follow on, life cycle procurements are estimated at approximately 500 units. This would bring the total savings to $5M. Using a total savings for the UEU of $5M results in a ROI for the UEU of approximately 2:1.

PARTICIPANTS

AIL Systems, Inc. (Universal Exciter)
Litton Guidance and Control Systems (Computer Interface Unit/Encoder)
Northampton Microelectronics Center (T2D)
EMPF (Program management, surface mount, and MCM manufacturing technology)

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